

WHAT IS CLAIMED IS:

1. A disk drive in which plural sets of servo data are arranged in a circumferential direction of a disk, each set containing N (a natural number
5 satisfying $N > 1$) types of servo data each including a unique type of servo address mark and position information, the disk drive comprising:

a composite head including a write element and a read element which are offset from each other in
10 a radial direction of the disk;

means for specifying, in a self servo write process utilizing the composite head, the type of servo address mark to be detected, which is one of N types of servo address marks included in the
15 respective N types of servo data, the specifying means operating, every time the servo data items of the same type, which are included in the respective sets of servo data, are written in the disk in a circle to switch to specification of a servo address mark unique
20 to the type of the servo data items;

means for detecting the servo address mark specified by the specifying means, in read data read from the disk by the read element of the composite head and then converted into digital data;

25 first control means for operating every time, during the self servo process, the detecting means detects the servo address mark specified by the

specifying means, to position the write element of the composite head at a target radial position on the disk on the basis of position information in servo data containing the servo address mark;

5 second control means for operating with the write element positioned at the target radial position on the disk, to cause the write element to write a corresponding type of additional servo data item in the disk at a position offset from the position of the
10 servo data containing the servo address mark specified by the specifying means, by a predetermined distance in the circumferential direction of the disk; and

 third control means for moving the composite head in the radial direction of the disk by a predetermined
15 pitch every time sets of additional servo data items are written in the disk in a circle, each set consisting of N types of data items.

2. The disk drive according to claim 1, further comprising means for holding the servo address mark
20 specified by the specifying means, wherein

 the detecting means detects, in the read data, the servo address mark held by the holding means.

3. The disk drive according to claim 2, wherein the holding means includes a register which holds the
25 servo address mark.

4. The disk drive according to claim 1, wherein after the self servo write process, the specifying

means specifies up to M (a natural number satisfying $1 < M < N$) arbitrary types of servo address marks included in the N types of servo address marks.

5 5. The disk drive according to claim 4, further comprising means for holding up to M types of servo address marks specified by the specifying means, the holding means holding one type of servo address mark during the self servo write process and up to M types of servo address marks after the self servo write
10 process, wherein

the detecting means detects, in the read data, the up to M types servo address marks held by the holding means.

15 6. The disk drive according to claim 5, wherein: the holding means includes M registers which can hold M types of servo address marks; and

the holding means sets, during the self servo write process, one of the N types of servo address marks which is to be detected, in one of the M
20 registers, while setting dummy servo address marks in the remaining registers, and sets, after the self servo write process, M types of servo address marks included in the N types of servo address marks, in the M registers.

25 7. The disk drive according to claim 1, wherein the specifying means indirectly specifies P (a natural number satisfying $0 < P < N$; $P=1$ for a self servo write

process) types of servo address marks which are to be detected and which are included in the N types servo address marks, using mode information indicative of a mode unique to the P types of servo address marks; and

5 the detecting means includes means for decoding the mode information specified by the specifying means to determine the P types of servo address marks unique to the mode indicated by the mode information, and detects the P types of servo address marks indicated
10 by the mode information specified by the specifying means.

8. The disk drive according to claim 7, further comprising means for holding the mode information specified by the specifying means, wherein

15 the detecting means detects, in the read data, the P types of servo address marks indicated by the mode information held by the holding means.

9. The disk drive according to claim 8, wherein:

20 the holding means includes a register which holds the mode information; and

 the detecting means detects, in the read data, the P types of servo address marks indicated by the mode information held by the register.

25 10. The disk drive according to claim 1, wherein the detecting means includes N servo address mark detectors which detect different types of servo address marks included in the N types of servo address

marks; and

the disk drive further comprises means for selecting one of the N servo address mark detectors which detects the servo address mark specified by the specifying means.

11. The disk drive according to claim 10, wherein the selecting means includes a selection register which holds servo address mark detector selection information comprising N bits corresponding to the N types of servo address marks, one of the N bits corresponding to the servo address mark of the type specified by the specifying means and representing a predetermined logical value; and

each of the N servo address mark detectors is selected if the corresponding bit in the servo address mark detector selection information held in the selection register has the predetermined logical value.

12. The disk drive according to claim 11, wherein each of the N servo address mark detectors has an enable terminal connected to the corresponding bit in the servo address mark detector information held in the selection register, and is enabled if the bit represents the predetermined logical value.

13. The disk drive according to claim 11, wherein the selecting means includes N switches provided in association with the N servo address mark detectors

and respective bits contained in the N-bit servo address mark detector selection information held in the selection register, and each of the N switches controls an input of the read data to the corresponding servo address mark detector in accordance with the logical value of the corresponding bit contained in the N-bit servo address mark selection information.

14. The disk drive according to claim 11, wherein the selecting means includes N switches provided in association with the N servo address mark detectors and respective bits contained in the N-bit servo address mark detector selection information held in the selection register, and each of the N switches controls an output of a detection result from the corresponding servo address mark detector.

15. A method of detecting an arbitrary servo address mark in a disk drive which utilizes a composite head including a write element and a read element to execute a self servo write process for arranging plural sets of servo data in a circumferential direction of a disk, the write element and the read element being offset each other in a radial direction of the disk, each set containing N (a natural number satisfying $N > 1$) types of servo data each including a unique type of servo address mark and position information, the method comprising:

during the self servo write process, specifying

the type of servo address mark to be detected, which is one of N types of servo address marks unique to the respective N types of servo data;

5 detecting the specified servo address mark in read data read from the disk by the read element of the composite head and then converted into digital data;

10 during the self servo process, every time the specified servo address mark is detected, positioning the write element of the composite head at a target radial position on the disk in accordance with position information in servo data containing the servo address mark;

15 with the write element positioned at the target radial position on the disk, using the write element to write a corresponding type of additional servo data item in the disk at a position offset from the position of the servo data containing the specified servo address mark, by a predetermined distance in
20 the circumferential direction of the disk;

every time the additional servo data items of the same type, which are included in the respective sets of servo data, are written in the disk in a circle, re-specifying a servo address mark unique to the type
25 of servo data items, as the servo address mark to be detected in the detecting; and

moving the composite head in the radial direction

of the disk by a predetermined pitch every time sets of additional servo data items are written in the disk in a circle, each set consisting of N types of servo data items.